

REMARKS

Claims 33, 35, 39-53, 56 and 57 are all the claims pending in the application.

Claim 52 has been amended to change "pm" to --µm-- to obviate the objection raised by the Examiner. The claims have also been amended to correct typographical errors.

Entry of the above amendments is respectfully requested.

I. Response to Rejection of claims 33, 35, 39-53, 56 and 57 under 35 U.S.C. § 103(a)

Claims 33, 35, 39-53, 56 and 57 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kawakami et al. (U.S. Patent 5,824,434) in view of Idota et al. (U.S. Patent 5,618,640).

Applicants respectfully traverse the rejection and submit that the cited references do not render the present invention obvious.

The Examiner's position is substantially the same as that set forth in the previous Office Action. Specifically, the Examiner asserts that Kawakami teaches a protective layer comprising organic and inorganic particles.

It is respectfully submitted that Kawakami does not teach or suggest a protective layer comprising both organic fine particles and inorganic fine particles. Kawakami discloses, at column 30, lines 24-34, that:

As the insulating material of the coating material of the positive pole of the secondary battery, any one of the following materials may be used which is selected from a group consisting of a polymer of the derivative of a large ring compound, a polymer of the derivative of an aromatic hydrocarbon, fluoro-resin, silicon resin, titanium resin, polyolefin, inorganic oxide, nitride, carbide and halide. It is effective for the positive pole of the lithium secondary battery to be covered with the polymer of the derivative of the large ring compound, the polymer of the derivative of the aromatic hydrocarbon or the fluoro-resin. (underlining added)

Thus, Kawakami discloses the use of one of the materials, i.e., either a polymer or an inorganic oxide, but does not teach or suggest the combined use of the materials listed. Accordingly, Kawakami does not teach or suggest a protective layer comprising both organic and inorganic particles.

In addition, the Examiner appears to take the position that the disclosure at column 36, lines 35-39 disclose the use of both inorganic and organic materials. However, as noted above, Kawakami discloses various materials that can be used in the protective layer, and there is no teaching or suggestion in Kawakami that would lead one of ordinary skill in the art to specifically select an inorganic oxide and an organic polymer from among various materials. Therefore, one of ordinary skill in the art would not be motivated to specifically use inorganic fine particles and organic fine particles.

Further, at column 36, lines 35-39, Kawakami discloses that:

As an alternative to this, a solution in which a monomer or an organic polymer or the organic polymer and a crosslinking material are dissolved in the colloidal solution is applied, and then the solution is polymerized or dried and polymerized so that the film is formed. (underlining added)

Thus, although Kawakami appears to disclose that organic and inorganic "materials" may be used together, Kawakami does not teach or suggest that organic fine particles and inorganic fine particles are used in combination in the protective layer. In this regard, the Examiner's assertion that Kawakami "fairly suggests" the use of fine particles appears to be based upon hindsight, which is improper. That is, Kawakami teaches the use of fine particles in a multi-layer metal oxide layer, however, Kawakami does not teach that fine particles are used in the protective layer of the positive electrode.

Moreover, one of ordinary skill in the art would not combine Kawakami and Idota.

MPEP §2141 mandates that a reference be considered as a whole. Therefore, the Examiner must consider the entire disclosure of Kawakami, and cannot ignore the passages of Kawakami teaching that the problem of dendrite generation in batteries using lithium or zinc in the negative pole is solved by the invention.

As noted in the previous response, Kawakami discloses that a large capacity lithium accumulator of the type that uses lithium metal as the negative pole has not been put into practical use because the generation of dendrite of lithium, which is the main cause of a short circuit, cannot be prevented (col. 1, lines 35-40). Kawakami also discloses that the same problem is encountered with batteries containing zinc in the negative poles. Therefore, the problem Kawakami sets out to solve is lithium or zinc dendrite formation, not simply dendrite formation, so that batteries containing lithium or zinc in the negative poles can be practically used.

In order to prevent the problem of generation of lithium or zinc dendrite, Kawakami teaches treating the surface of the negative pole with a polymer film of a derivative of an aromatic hydrocarbon compound (see col. 2, lines 20-26 and col. 9, lines 17-30) or a nitrogen compound or halogen compound (col. 2, lines 54-57) or a film comprising other materials, such as an inorganic glass structure (col. 7, lines 62 to col. 8, line 8), an organic metal compound (col. 10, line 45-56), fluorine resin (col. 11, line 57 to col. 12, line 5) or a large ring compound (col. 13, line 14-27). Since an objective of Kawakami is to specifically reduce dendrites of lithium and zinc in the negative electrode, and not simply to reduce dendrite formation in general, one of ordinary skill in the art would be dissuaded from using a different active material. Therefore, one of ordinary skill in the art would not select the composite oxide

containing tin and use it in Kawakami to arrive at the present invention.

For the above reasons, it is respectfully submitted that the cited references do not teach or suggest the present invention.

Accordingly, withdrawal of the rejection is respectfully requested.

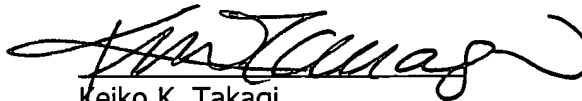
II. Conclusion

In view of the foregoing, reconsideration and allowance of claims 33, 35, 39-53, 56 and 57 is respectfully requested.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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